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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BURD, KEVIN MICHAEL

ART UNIT PAPER NUMBER

2631

DATE MAILED: 09/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/551,889

Applicant(s)

WILLIAMS, RICHARD G. C.

Examiner

Kevin M Burd

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 11 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 9 and 13 is/are allowed.
- 6) ☐ Claim(s) 1-8, 10, 11 and 14-19 is/are rejected.
- 7) ☐ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 June 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. Figure 1 of the instant application is shown in "180 Degree Phase Invariance for Recommendation V.92" by Dae-Young Kim et al dated March 22, 2000 on page 4.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the differential decoding being performed after a multiple modulus decoder of claims 12 and 15, the frame being differentially encoded before being supplied to a multiple modulus encoder of claims 13 and 16, the differential encoding is performed on the input to a multiple modulus encoder of claim 18, and the differential decoding is performed on the input to a multiple modulus decoder of claim 19 must be shown or the features canceled from the claims. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: On page 4, lines 9-11, the output of block 105 of figure 1 is stated as $K_0:K_{11}$. However, figure 1 discloses the output of block 105 as $u(n)$. Correction should be made so the figure 1 and the specification are consistent. On page 7, lines 1-4, the instant application recites "After determining the sign, the process 200 proceeds to state 210. In state 210, the process 200 differentially encodes the sign of the frame." Figure 2 shows after the sign of the frame value is determined in step 210, the process 200 proceeds to step 215 to differentially encode the sign. Therefore, the disclosure should state 215 differentially encodes the sign, not step 210. "In state 215," should be recited in line 2.

Appropriate correction is required.

Claim Objections

4. Claims 12 and 15 are objected to because of the following informalities: in line 2, the phrase "being supplied to" should be inserted between the terms "after" and "a".
5. Claim 14 is objected to because of the following informalities: in line 3, the term "the frame" is recited. This should be changed to "a frame". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-8, 10 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the channel output" in line 6. There is insufficient antecedent basis for this limitation in the claim. In addition, it is unclear from the claim if the channel output comprises the differentially encoded sign and the differentially encoded frame. Claim 1 does not recite both the differentially encoded sign and frame are transmitted on a channel to produce a channel output. Claims 2-8 are inherently rejected due to dependence on claim 1.

Claims 2 and 3 recite the limitation "the sign" in line 1. Claims 2 and 3 recite the term "the sign". It is unclear from the claims which sign this term is referring to since two signs are introduced in the independent claims. A sign of the frame and a sign of the output are recited in claim 1.

Claims 2, 3, 5, 8, 10 and 11 recite the limitation "the frame value". There is insufficient antecedent basis for this limitation in the claim.

Claims 2, 3, 10 and 11 recite the limitation "the moduli" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claim 14 is rejected under 35 U.S.C. 102(b) as being anticipated by Lemaitre et al (US 5,555,547).

Regarding claim 14, Lemaitre discloses a method of using a modulation-demodulation system (figures 3A and 3B) for correcting for phase shifts (phase skips, column 5, lines 36-43). The data to be transmitted is differentially encoded (figure 3A, element 13), transmitted and differentially decoded (figure 3B, element 28). Column 6, lines 14-52 describe the method. The data has a frame structure (column 6, lines 44-52).

8. Claims 17-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Maurer et al (US 6,418,170).

Regarding claim 17, Maurer discloses a method of compensating for phase reversals, or phase shifts, in a PCM modem system (abstract). A sign bit is attributed to an equivalence class (column 2, lines 52-56). The equivalence classes are utilized to allow a larger minimum distance between constellation points in encoding the incoming data (column 1, lines 16-21). The sign bit is differentially encoded (column 5, lines 3-6) in differential encoder 16 of figure 2. The sign bit is differentially decoded in differential decoder 38 in figure 3. The decoding step is described in column 5, lines 41-49.

Regarding claim 18, figure 2 discloses the information on line 10 is input to the modulus coder 12. The processed input signal is input to the differential encoder 16 where the processed input signal is differentially encoded.

Regarding claim 19, figure 3 discloses the output of the differential decoder 38 is input to the modulus conversion decoder 40 to recover the original information.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lemaitre et al (US 5,555,547)) in view of Norrell et al (US 6,084,883).

Regarding claim 15, Lemaitre discloses a method of using a modulation-demodulation system for correcting for phase shifts as stated above. Viterbi decoding takes place in elements 24 and 25 of figure 3B. The output of these decoders is input to the differential decoder (element 28). The Viterbi decoder enables operation of the transmission system with lower signal to noise ratios (column 1, lines 25-30). Lemaitre does not disclose the differential encoding is performed before being supplied to a multiple modulus encoder. Norrell discloses a method of encoding data by generating a multiple modulus signal (abstract). This encoding will facilitate efficient data transmission and recovery by the distant receiver even in the presence of interference

(abstract). Figure 5 shows the generation of the multiple modulus coefficients is the final step completed prior to transmission of the signal (steps 120 and 130). Column 7, lines 22-39, discloses the symbols are received at the receiver and are decoded by a reverse modulus conversion to recover the binary data. It would have been obvious for one of ordinary skill in the art at the time of the invention to utilize the multiple modulus decoding method of Norrell into the method of using a modulation-demodulation system for correcting for phase shifts to allow the data transmission to be efficient and allow the recovery of the signal at the receiver to take place even in the presence of interference (Norrell, abstract). In addition, Norrell states another advantage of using the multiple modulus conversion encoding and decoding method is that it allows a non-integer number of bits to be mapped to each symbol, which increases efficiency (column 7, lines 22-26).

Regarding claim 16, Lemaitre discloses a method of using a modulation-demodulation system for correcting for phase shifts as stated above. Convolutional encoding takes place in elements 16 and 17 of figure 3A. The input of these encoders is output from the differential encoder (element 13). The convolutional encoder enables operation of the transmission system with lower signal to noise ratios (column 1, lines 25-30). Norrell discloses a method of encoding data by generating a multiple modulus signal (abstract). This encoding will facilitate efficient data transmission and recovery by the distant receiver even in the presence of interference (abstract). Figure 5 shows the generation of the multiple modulus coefficients is the final step completed prior to transmission of the signal (steps 120 and 130). It would have been obvious for one of

ordinary skill in the art at the time of the invention to utilize the multiple modulus encoding method of Norrell into the method of using a modulation-demodulation system for correcting for phase shifts to allow the data transmission to be efficient and allow the recovery of the signal at the receiver to take place even in the presence of interference (Norrell, abstract). In addition, Norrell states another advantage of using the multiple modulus conversion encoding and decoding method is that it allows a non-integer number of bits to be mapped to each symbol, which increases efficiency (column 7, lines 22-26).

Allowable Subject Matter

7. Claims 9 and 13 are allowed.
8. Claim 1 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.
9. Claims 2-8, 10 and 11 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Contact information

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

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(703) 872-9314, (for formal communications intended for entry or for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Burd, whose telephone number is (703) 308-7034. The Examiner can normally be reached on Monday-Thursday from 9:00 AM - 6:00 PM.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3800.



Kevin M. Burd
PATENT EXAMINER
9/9/03